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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Mathematics, 2008

90152 Solve right-angled triangle problems

Credits: Two
9.30 am Monday 24 November 2008

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

You should show ALL working.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Solve right-angled triangle problems. ☐	Solve problems in practical situations involving right-angled triangles. ☐	Solve problems in word or 3D situations. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE

A radio tower, RT, is 35 metres high.
A cable TC, 45 metres long, helps secure the tower.

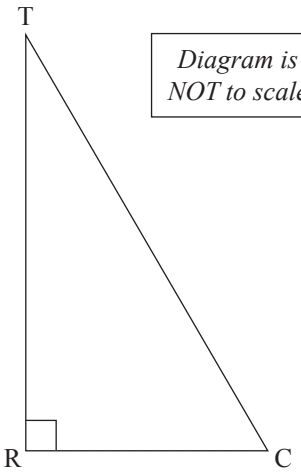

Diagram is NOT to scale

What is the distance of point C from the base of the tower, R?

The distance = _____ m

QUESTION TWO

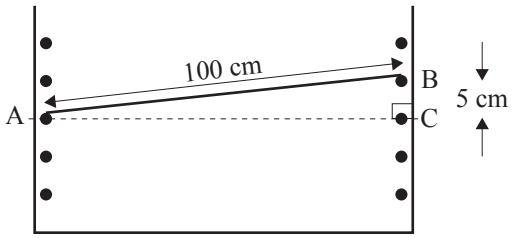

Diagram is NOT to scale

A bookcase has shelves that can be adjusted.
Shelf AB is 100 cm long.
One end of the shelf is 5 cm higher than the other end.

Calculate the angle the shelf AB makes with the horizontal AC.

Angle BAC, the angle of the shelf to the horizontal, = _____ °

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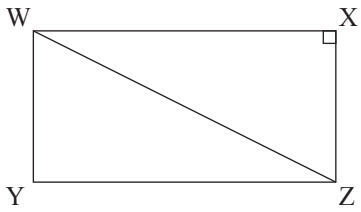
QUESTION THREE

The diagram shows a wooden gate.

Angle WXZ is a right angle.
The width of the gate WX is 2.35 m.
The height of the gate XZ is 1.31 m.

Find the length of WZ.

Diagram is NOT to scale

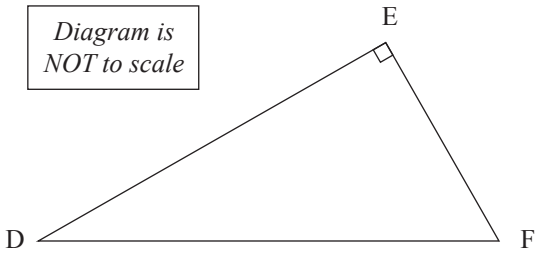


Length WZ = _____ m

QUESTION FOUR

The triangle DEF shows the end of the roof on a house.
Angle DEF is a right angle.
ED is 3.25 m long.
The pitch of one side of the roof, angle EDF, is 35°.

Diagram is NOT to scale



What is the length of EF?

Length EF = _____ m

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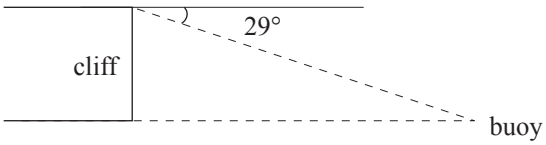
QUESTION FIVE

The top of a cliff is 35 m above sea level.
A buoy floating in the sea is observed by looking down through an angle of 29° from the top of the cliff. [The angle of depression = 29°.]

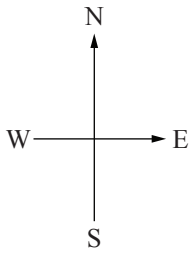


What is the distance from the top of the cliff to the buoy?

Distance = _____ m

QUESTION SIX

A programable remote control car's movement is described by vectors.



The axes are shown.

The remote control car begins from the origin (0,0).

What is the bearing of the remote control car from the origin after

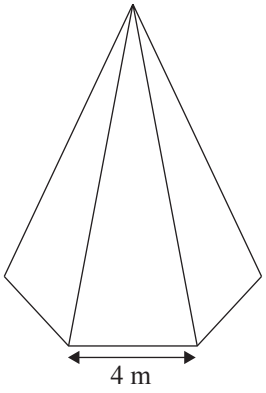
a movement of $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$ and then $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$?

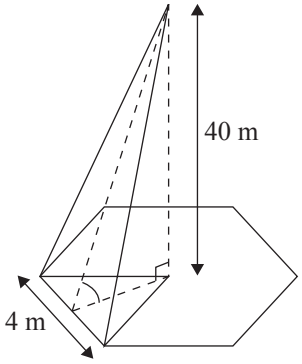
Bearing of remote control car from origin = _____ °

QUESTION SEVEN

Assessor's use only

A church has a vertical spire of height 40 metres.
The base is a horizontal regular hexagon, with sides of 4 metres as shown in the diagrams.
[A regular hexagon is a polygon made up from 6 equilateral triangles.]





Calculate the angle between each triangular face of the spire and the horizontal hexagon base.

Angle between face of spire and the horizontal hexagon base = _____ °

QUESTION EIGHT

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Mt Jordan, Mt Brettell and Mt Law are three mountains of exactly the same height.
The direction and distances between the tops of the mountains were measured.
Mt Jordan is 20 km from Mt Brettell, at a bearing of 143°.
Mt Law is 27 km from Mt Jordan, at a bearing of 230°.

(a) Find the distance between the tops of Mt Law and Mt Brettell.

(b) Find the bearing of the top of Mt Law from the top of Mt Brettell.

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Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question number